<u>In the Claims</u>:

1. (Currently Amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference <u>by</u> producing an estimate of the signal transmitted by the transmitter, wherein ~~when using a zero-forcing function,~~ estimates for the signal ~~may be~~ <u>use a zero forcing function</u> expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is the received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, *Nc* is the spreading gain, *Q* is the number of received antennas, *M* is the number of multiple users, $\widetilde{W}$ is the weighting vector, $\sqrt{\rho_i}$ is the i-th power source, and *Ci* is the i-th spreading code.

2. (Canceled)

3. (Original) The method of claim 1, wherein the computing of the CLTD weighting vector comprises:

calculating a channel estimate from the received signal; and

computing the CLTD weighting vector based on the channel estimate.

4-5. (Canceled)

6. (Currently Amended) The method of claim 1, wherein the computation of the estimates for the signal ~~can be~~ is implemented using a parallel or serial interference cancellation technique.

7-8. (Canceled)

9. (Currently Amended) ~~The method of claim 1 wherein the using comprises:~~ A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference by

equalizing the received signal; and

despreading the equalized received ~~signal.~~ signal;

wherein estimates for the signal are expressed as

$$z_{ZF} = (\widetilde{W}^H H^H H \widetilde{W})^{-1} \widetilde{W}^H H^H r,$$

where r is the received signal, H is the channel estimate, and $\widetilde{W}$ is the weighting vector.

10. (Currently Amended) The method of claim 9, ~~wherein there are multiple users, and~~ wherein the despreading applies the spreading codes from each user to the equalized received signal.

11. (Currently Amended) The method of claim 9, wherein the equalizing applies the CLTD weighting vector and [[a]] the channel estimate to the received signal.

12-13. (Canceled)

14. (Currently Amended) The method of claim 9, wherein an equalizer to perform the equalization ~~can be~~ is implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

15-18. (Canceled)

19. (Currently Amended) The method of claim 45, ~~15, wherein there are multiple users, and~~ wherein the despreading applies the spreading codes from each user to the equalized received signal.

20. (Original) The method of claim 19, wherein the despreading produces a symbol stream for each user.

21. (Currently Amended) The method of claim ~~15,~~ 45, wherein the coherent combining applies the CLTD weighting vector to despread symbol intervals.

22. (Currently Amended) The method of claim 21, ~~wherein there are multiple users, and~~ wherein the coherent combining further applies the channel estimate and spreading codes from each user.

23. (Currently Amended) The method of claim ~~15,~~ 45, wherein an equalizer to perform the equalization ~~can be~~ is implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

24-27. (Canceled)

28. (Original) The method of claim 24 wherein the using comprises:

equalizing the received signal; and

despreading the equalized received signal.

29. (Canceled)

30. (Currently Amended) A receiver comprising:

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel; ~~channel, wherein estimates for the signal use a zero forcing function expressed as:~~

$$\cancel{y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M},$$

~~where r is a received signal, A is defined as~~ $\cancel{H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]}$~~, H is an estimate of the communications channel,~~ $\cancel{Nc}$ ~~is a spreading gain,~~ $\cancel{Q}$ ~~is a number of received antennas,~~ $\cancel{M}$ ~~is a number of multiple users,~~ $\cancel{\widetilde{W}}$ ~~is a weighting vector,~~ $\cancel{\sqrt{\rho_i}}$ ~~is an i-th power source, and~~ $\cancel{Ci}$ ~~is an i-th spreading code;~~

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute ~~the~~ a computed weighting vector from the estimate of the communications channel;

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the ~~estimate of the communications channel~~ computed weighting vector back to a source of the received signal provided by the signal input;

a weight verification unit coupled to the channel estimation unit and the weighting vector unit, the weight verification unit containing circuitry to generate a comparison result by comparing the computed weighting vector with a received weighting vector received by the signal input; and

an interference resistant detection unit coupled to the signal ~~input,~~ input and to the weight verification unit, the interference resistant detection unit containing circuitry to use the estimate of the communications channel, spreading codes, and the weighting vector ~~to improve~~ comparison result for interference resistance of the receiver, wherein the receiver receives signals from a plurality of users.

31-32. (Canceled)

33. (Previously Presented) The receiver of claim 30, wherein the interference resistant detection unit first equalizes the received signal and then despreads the equalized received signal.

34. (Previously Presented) The receiver of claim 30, wherein the interference resistant detection unit first equalizes the received signal, then despreads the equalized received signal, and then coherently combines the despread received signal.

35. (Canceled)

36. (Currently Amended) The communications system of claim ~~35,~~ 30, wherein the communications channel is a wireless communications channel.

37. (Original) The communications system of claim 36, wherein the communications system is a code-division multiple access (CDMA) communications system.

38. (Original) The communications system of claim 36, wherein the transmitter transmits the encoded and spread data stream over multiple antennas.

39. (Currently Amended) The method of claim 50, wherein the suppressing interference further comprises: ~~A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:~~

~~receiving a signal;~~

~~computing a CLTD weighting vector from the received signal;~~

~~providing the CLTD weighting vector to a transmitter; and~~

~~using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference~~ producing an estimate of the second signal transmitted by the transmitter, wherein ~~when using a minimum mean-square error function,~~ estimates for the second signal ~~may be~~ use a minimum mean square error function expressed as:

$$y_{MMSE} = (A^H A + \sigma^2 \Lambda^{-1})^{-1} A^H r = \Lambda A^H (A \Lambda A^H + \sigma^2 I_{NN_C Q})^{-1} r,$$

where r is the received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, Nc is the spreading gain, Q is the number of received antennas, M is

the number of multiple users, $\widetilde{W}$ is the weighting vector, ρ_i is the i-th power source, $\Lambda = E[dd^H]$, I is the identity matrix, and Ci is the i-th spreading code.

40. (Currently Amended) The method of claim 39, wherein the computation of the estimates for the <u>second</u> signal ~~can be~~ <u>is</u> implemented using a parallel or serial interference cancellation technique.

41. (Canceled)

42. (Currently Amended) The method of claim ~~41,~~ <u>51, wherein the suppressing interference further comprises:</u>

<u>producing an estimate of the second signal transmitted by the transmitter,</u> wherein estimates for the <u>second</u> signal ~~may be~~ <u>are</u> expressed as:

$$z_{MMSE} = (W^H H^H H\widetilde{W} + (\sigma^2/\mu) I_{NN_C})^{-1} \widetilde{W}^H H^H R$$

$$= \widetilde{W}^H H^H (H\widetilde{W}\widetilde{W}^H H^H + (\sigma^2/\mu) I_{NN_C Q})^{-1} r,$$

where $\mu = \frac{1}{N_c}\sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, H is the channel estimate, $\widetilde{W}$ is the weighting vector, and I is the identity matrix.

43-44. (Canceled)

45. (Currently Amended) ~~The method of claim 44,~~ <u>A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:</u>

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference by

equalizing the received signal;

despreading the equalized received signal; and

coherent combining the despread equalized received signal,

wherein estimates for the signal ~~may be~~ are expressed as:

$$z_{ZF} = (H^H H)^{-1} H^H r, \quad Q \geq P$$

where r is the received signal, H is the channel estimate, and Q is the number of received antennas.

46. (Currently Amended) The method of claim ~~45,~~ 52, wherein the suppressing interference further comprises:

producing an estimate of the second signal transmitted by the transmitter, wherein estimates for the second signal ~~may be~~ are expressed as:

$$z_{MMSE} = (H^H H + (\sigma^2 / \mu) I_{NN_C P})^{-1} H^H r$$

$$= H^H (H H^H + (\sigma^2 / \mu) I_{NN_C Q})^{-1} r$$

where $\mu = \frac{1}{N_c} \sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, H is the channel estimate, and Q is the number of received antennas, ρ_i is the i-th power source.

47. (New) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) comprising:

receiving a first signal at a receiver;

the receiver computing a first CLTD weighting vector from the first received signal;

the receiver providing the CLTD weighting vector to a transmitter;

receiving a second signal weighted by a second CLTD weighting vector at the receiver;

the receiver comparing the first and second CLTD weighting vectors; and

the receiver suppressing interference based on a result of the comparison of the first and second CLTD weighting vectors.

48. (New) The method of claim 47, wherein the comparing the first and second CLTD weighting vectors comprises verifying that the second CLTD weighting vector is the same as the first CLTD weighting vector.

49. (New) The method of claim 47, wherein the first CLTD weighting vector is delayed in the receiver before being compared to the second CLTD weighting vector.

50. (New) The method of claim 47, wherein the suppressing interference further comprises using a channel estimate and spreading codes for each user.

51. (New) The method of claim 47, wherein the suppressing interference further comprises:

equalizing the second received signal; and

despreading the equalized received signal.

52. (New) The method of claim 47, wherein the suppressing interference further comprises:

equalizing the second received signal;

despreading the equalized received signal; and

coherent combining the despread received signal.

53. (New) The receiver of claim 30, wherein estimates for the signal use a zero forcing function expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M ,$$

where r is a received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is an estimate of the communications channel, *Nc* is a spreading gain, *Q* is a number of received antennas, *M* is a number of multiple users, $\widetilde{W}$ is a weighting vector, $\sqrt{\rho_i}$ is an i-th power source, and *Ci* is an i-th spreading code.